Traffic Noise
Summary of Technical Memorandum

The purpose of this Technical Memorandum is to identify, discuss, and examine existing and future traffic noise levels in the study area. The goal of the noise analysis was to identify potential traffic noise impact in the design year 2025 to adjacent residents. The analysis is in accordance with the most current Federal Highway Administration (FHWA) and the Michigan Department of Transportation (MDOT) policy and procedures.

Traffic Noise Regulations

Traffic noise impacts for the proposed US-131 Improvement Study were evaluated in accordance with the most current FHWA policy and procedures, and the Michigan Department of Transportation (MDOT) traffic noise analysis and abatement guidelines. *The Federal-Aid Highway Act of 1970* established the requirement that traffic noise control be a part of the planning and design of all federal-aid roadways. FHWA developed guidelines for conducting traffic noise studies and has established traffic Noise Abatement Criteria (NAC) for specific land use categories involving outside human activity. Because "approaching" the NAC is defined by MDOT policy as being within one dBA of the NAC, all properties covered by NAC B (generally residential) that have a calculated L_{eq} value of 66 dBA or higher would "approach or exceed" the 67 dBA NAC B criterion. All properties covered by NAC C (commercial, industrial, and manufacturing) with a L_{eq} value of 71 dBA or higher would "approach or exceed" the 72 dBA NAC C criteria. Therefore, L_{eq} values of 66 dBA for NAC B, and 71 dBA for NAC C were used the threshold values.

Traffic Noise Assessment

A traffic noise assessment was performed in accordance with the FHWA procedures *23 CFR Part 772* and the *Michigan Department of Transportation's Highway Traffic Noise Analysis and Abatement Policy, July 2003*. The FHWA and MDOT guidelines establish the sound level at which there is an impact. The assessment in its general form proceeded to identify existing and potential traffic noise impacts. The assessment also identified locations to consider feasible, effective, and economically reasonable traffic noise abatement measures likely to be implemented where traffic noise impact is identified.

Traffic noise levels for the project were predicted for existing (2003) and future year (2025) conditions using the available computer modeling techniques of the FHWA Traffic Noise Model (TNM) Look-Up Tables (TNMLOOK). These tables have pre-calculated noise levels based upon distance from traffic and the volume and speed of traffic. A preliminary calculation of noise levels is provided without monitoring or extensive computer modeling. A more detailed analysis will be performed by modeling with the Traffic Noise Model (TNM version 2.5) once a Recommended Alternative has been identified for the Final Environmental Impact Statement (FEIS). At that time, any potential mitigation requirements will also be considered for the Recommended Alternative.

Locations and groupings of representative noise sensitive receptors most likely to be impacted were identified in the study area. These noise sensitive receptor locations were selected based on land use type, traffic volumes and proximity to the existing and

proposed roadway. The locations were identified by using topographic survey information, aerial photography and by visits to the study area. Any receptors that might be displaced (acquired) by the project as proposed were not assessed for potential traffic noise impacts.

Existing Traffic Noise Levels

Under existing traffic conditions (2003), the NAC B of 66 dBA was exceeded at approximately 152 residential locations (FHWA Land Use Category B Properties) from 185 sensitive receptor locations evaluated. The FHWA NAC of 72 dBA was not approached or exceeded at any developed land (commercial, industrial, and manufacturing) locations (FHWA Land Use Category C Properties) out of approximately 49 identified sensitive receptor properties.

Future Traffic Noise Levels

Below is a description of future noise levels for each alternative, by NAC category. The predicted No-Build and Practical Alternatives 2025 design year traffic noise sensitive receptors exceeding the NAC are depicted in **Figure A.1**.

No-Build Alternative: The predicted No-Build design year 2025 traffic noise levels will exceed 66 dBA for approximately 176 residential locations from the approximate same number of 249 sensitive receptor locations identified. Traffic noise levels will not approach or exceed the FHWA noise abatement criteria (NAC) of 72 dBA at any developed land locations (NAC Category C), for any of the 11 identified potential sensitive receptor. Compared to the other Build Alternatives, the No-Build has the most residential noise impacts, largely because of the bypass of the denser residential developments around the Village of Constantine.

Practical Alternative 1 (PA-1): The predicted PA-1 design year 2025 traffic noise levels will exceed 66 dBA for approximately 6 residential locations (NAC Category B) from the approximate same number of 24 sensitive receptor locations identified. Traffic noise levels will not approach or exceed the FHWA noise abatement criteria (NAC) of 72 dBA at any developed land locations (NAC Category C), for any of the approximately 11 identified potential sensitive receptor locations.

Practical Alternative 2 (PA-2): The predicted PA-2 design year 2025 traffic noise levels will exceed 66 dBA for approximately 10 residential locations (NAC Category B) from the approximate same number of 27 sensitive receptor locations identified. Traffic noise levels will approach or exceed 72 dBA at approximately 1 developed land (commercial, industrial, and manufacturing) locations (NAC Category C) out of approximately 11 identified sensitive receptor locations.

Practical Alternative 3 (PA-3): The predicted PA-3 design year 2025 traffic noise levels will exceed 66 dBA for approximately 10 residential locations (NAC Category B) from the approximate same number of 13 sensitive receptor locations identified. Traffic noise levels will not approach or exceed the FHWA noise abatement criteria (NAC) of 72 dBA at any developed land locations (NAC Category C), for any of the approximately 2 identified potential sensitive receptor locations.

Practical Alternative 4 (PA-4): The predicted PA-4 design year 2025 traffic noise levels will exceed 66 dBA for approximately 9 residential locations (NAC Category B) from the approximate same number of 12 sensitive receptor locations identified. Traffic noise levels will not approach or exceed the FHWA noise abatement criteria (NAC) of 72 dBA at any developed land locations (NAC Category C), for any of the approximately 1 identified potential sensitive receptor locations.

Practical Alternative 5 (PA-5): The predicted PA-5 design year 2025 traffic noise levels will exceed 66 dBA for approximately 14 residential locations (NAC Category B) from the approximate same number of 35 sensitive receptor locations identified. Traffic noise levels will not approach or exceed 72 dBA at any developed land locations (NAC Category C), for any of the approximately 19 identified potential sensitive receptor locations.

Practical Alternative 5 MOD (PA-5 MOD): The predicted PA-5 design year 2025 traffic noise levels will exceed 66 dBA for approximately 50 residential locations (NAC Category B) from the approximate same number of 117 sensitive receptor locations identified. The traffic noise levels did not approach or exceed the FHWA noise abatement criteria (NAC) of 72 dBA at any developed land locations (FHWA Land Use Category C), out of approximately 0 identified receptor locations.

Impacts of Build Alternatives Summary: Properties that will be displaced by the Build Alternatives are not included in the assessment of noise impacts. The number of properties with calculated noise levels approaching NAC B (including residences, parks, and institutional uses) would drop dramatically under all Build Alternatives from the existing and future No-Build conditions. A new roadway alignment would reduce traffic noise that currently impacts a large number of properties along existing US-131 in the Village of Constantine, by relocating through traffic to areas of lower development density. Along the new alignments, residences would generally be located further from the roadway than they are along the existing alignment. Overall, PA-1 would impact the fewest Category B properties of all Build Alternatives (6), and PA-5-MOD would impact the most (50). Note that all Build Alternatives would have less impact than the No-Build Alternative, largely because of the bypass of the denser residential developments around the Village of Constantine.

The PA-2 Alternative is the only alternative that would affect a commercial and industrial Category C property. Category C properties typically are commercial or industrial properties where traffic noise levels are not as much of a concern as with Category B properties because no identified outside human activity was identified as receptors of the noise for Category C properties.

Mitigation of Traffic Noise

FHWA regulations require that after the identification of traffic noise impacts, an examination of potential mitigation measures be conducted. The predicted No-Build and Practical Alternatives 2025 design year traffic mitigation measures for noise sensitive receptors exceeding the NAC are depicted in **Figure A.2**. Based on this examination, reasonable and feasible noise mitigation measures will be incorporated into the highway project, if required. FHWA regulations do not require that noise abatement criteria be met in every instance, but rather that every reasonable and feasible effort is made to provide noise mitigation when the criteria are approached or exceeded.

Where appropriate, the standard method of mitigating traffic noise impacts is constructing a noise barrier. Noise barriers are typically earthen berms and/or vertical walls provided for zoned residential land uses and institutional structures, such as hospitals, libraries, schools, and churches.

Mitigation Examination of Practical Alternative 1 (PA-1): As **Tables 4.12a** and **4.12b** indicate, the predicted PA-1 design year 2025 traffic noise levels will approach or exceed the FHWA noise abatement criteria (NAC) of 66 dBA at approximately 6 residential locations (NAC Category B) compared to approximately 24 sensitive receptor locations identified. Traffic noise levels will not approach or exceed the FHWA noise abatement criteria (NAC) of 72 dBA at any developed land locations (NAC Category C) compared to approximately 11 identified potential sensitive receptor locations identified. However, installation of a noise barrier at the 6 residential locations is not a feasible or reasonable improvement. Since the residential locations are widely spaced apart, any noise barrier would provide shielding at only one location per barrier. As a result, Mitigation Measures are not warranted for any of the approached or exceeded noise receptors that were identified for this alternative.

Mitigation Examination of Practical Alternative 2 (PA-2): As **Tables 4.12a** and **4.12b** indicate, the predicted PA-2 design year 2025 traffic noise levels will approach or exceed the FHWA noise abatement criteria (NAC) of 66 dBA at approximately 10 residential locations (NAC Category B) compared to approximately 27 sensitive receptor locations identified. Traffic noise levels will approach or exceed the FHWA noise abatement criteria (NAC) of 72 dBA at 1 developed land location (NAC Category C) compared to approximately 11 identified potential sensitive receptor locations identified. However, installation of a noise barrier at the 6 residential locations is not a feasible or reasonable improvement. Since the residential locations are widely spaced apart, any noise barrier would provide shielding at only one location per barrier. As a result, Mitigation Measures are not warranted for any of the approached or exceeded noise receptors that were identified for this alternative.

Mitigation Examination of Practical Alternative 3 (PA-3): As **Tables 4.12a** and **4.12b** indicate, the predicted PA-3 design year 2025 traffic noise levels will approach or exceed the FHWA noise abatement criteria (NAC) of 66 dBA at approximately 10 residential locations (NAC Category B) compared to approximately 13 sensitive receptor locations identified. Traffic noise levels will not approach or exceed the FHWA noise abatement criteria (NAC) of 72 dBA at any developed land locations (NAC Category C) compared to approximately 2 identified potential sensitive receptor locations identified. However, installation of a noise barrier at the 6 residential locations is not a feasible or reasonable improvement. Since the residential locations are closely spaced, any noise barrier would require openings in the barrier segment for driveway access resulting in an ineffective noise barrier. As a result, Mitigation Measures are not warranted for any of the approached or exceeded noise receptors that were identified for this alternative.

Mitigation Examination of Practical Alternative 4 (PA-4): As **Tables 4.12a** and **4.12b** indicate, the predicted PA-4 design year 2025 traffic noise levels will approach or exceed the FHWA noise abatement criteria (NAC) of 66 dBA at approximately 9 residential locations (NAC Category B) compared to approximately 12 sensitive receptor locations identified. Traffic noise levels will not approach or exceed the FHWA noise abatement criteria (NAC) of 72 dBA at any developed land locations (NAC Category C) compared to approximately 1 identified potential sensitive receptor locations identified. However, installation of a noise barrier at the 6 residential locations is not a feasible or reasonable

improvement. Since the residential locations are closely spaced with many cross street openings would require openings in the barrier segment for cross street access resulting in an ineffective noise barrier. As a result, Mitigation Measures are not warranted for any of the approached or exceeded noise receptors that were identified for this alternative.

Mitigation Examination of Practical Alternative 5 (PA-5): As **Tables 4.12a** and **4.12b** indicate, the predicted PA-5 design year 2025 traffic noise levels will approach or exceed the FHWA noise abatement criteria (NAC) of 66 dBA at approximately 14 residential locations (NAC Category B) compared to approximately 35 sensitive receptor locations identified. Traffic noise levels will not approach or exceed the FHWA noise abatement criteria (NAC) of 72 dBA at any developed land locations (NAC Category C) compared to approximately 19 identified potential sensitive receptor locations identified. However, installation of a noise barrier at the 6 residential locations is not a feasible or reasonable improvement. Since the residential locations are widely spaced apart, any noise barrier would provide shielding at only one location per barrier. As a result, Mitigation Measures are not warranted for any of the approached or exceeded noise receptors that were identified for this alternative.

Mitigation Examination of Practical Alternative 5-Modified (PA-5-Modified): As **Tables 4.12a** and **4.12b** indicate, the predicted PA-5-Modified design year 2025 traffic noise levels will approach or exceed the FHWA noise abatement criteria (NAC) of 66 dBA at approximately 50 residential locations (NAC Category B) compared to approximately 117 sensitive receptor locations identified. Traffic noise levels will not approach or exceed the FHWA noise abatement criteria (NAC) of 72 dBA at any developed land locations (NAC Category C) compared to approximately 0 identified potential sensitive receptor locations identified. However, installation of a noise barrier at the 6 residential locations is not a feasible or reasonable improvement. Since the residential locations are closely spaced with many cross street openings would require openings in the barrier segment for cross street access resulting in an ineffective noise barrier. As a result, Mitigation Measures are not warranted for any of the approached or exceeded noise receptors that were identified for this alternative.

If a Build Alternative is recommended, the current MDOT criteria for noise abatement (2003) and the applicability of these criteria to provide abatement for affected receptors will be investigated in detail for the Recommended Alternative and documented in the FEIS based upon reasonability and feasibility as follows:

1. For a proposed highway project, a traffic noise analysis would be performed to determine if noise abatement is feasible and reasonable for developed land, undeveloped lands at planned development locations, and for local community land use and planning.

2. Public meetings would be advertised in local news media and held in local facilities during the route location and planning stages of the roadway or the physical alteration of the existing highway significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes, for the purpose of discussing the present and future environmental, social, and economic impacts.

3. Comments on noise concerns would be solicited at public meetings from local residents, and officials of the jurisdiction(s) affected by the project. MDOT would use this information to draft the final environmental document. Once the final

environmental document (Record of Decision) is approved by the FHWA, it is distributed to the local officials affected by the project to notify them of location approval. The FHWA approval date is the date of public knowledge.

4. If during the final design the noise mitigation project is determined to be not reasonable, the local jurisdiction(s) would be asked if they wish to increase their financial participation in the noise abatement portion of the project to cover the cost per residence by the amount greater than $34,722 (2004) as set forth in this document, or have noise abatement dropped from further consideration.

5. Noise abatement would only be provided when feasible and reasonable for residential land use locations, public land use (parks), and non-profit institutional facilities such as hospitals, libraries, schools, and churches (public use facilities would be equated to ten dwelling units each).

6. All sites would be considered. However, it is generally known that commercial and industrial sites prefer that there be no interference with the view to their establishments. Therefore, when commercial and residential sites expected to convert to a commercial or industrial land use (e.g., some of the residential units have converted to commercial/industrial, or the area has been rezoned commercial) are found to be reasonable and feasible, they would be asked if they want noise abatement. If they do not want it, it would not be provided.

7. When negative noise impacts are expected to occur, noise abatement would be considered and would be implemented if found feasible and reasonable for existing developments, and future developments were approved before the date of public knowledge. After the date of public knowledge, MDOT would not be responsible for providing noise abatement for new developments. The provision of noise abatement for new developments becomes the responsibility of local governments and private developers.

8. All noise abatement would follow MDOT design standards.

9. MDOT would maintain the structural integrity of the noise abatement structure and would be responsible for the aesthetic condition of the structure on the roadway side only. The exception being that when the structure is on the residential side of a service road, MDOT would maintain structural integrity for five years, but would not be responsible for either side of the structure's aesthetic condition, including the surrounding grounds.

10. Local authorities must agree, through agreements, resolutions, or ordinances, to provide:

    - A share of the state and local funding based on population (per State of Michigan Act 51)
    - Aesthetic maintenance on the residential side of the structure, or on both sides when the structure is on the residential side of a service road
    - Structural maintenance after five years when the structure is on the residential side of a service road

Explanation of bullets two and three: These statements have been included because there is no right-of-way access to these walls for maintenance purposes.

Failure to meet all of the above requirements would make the noise abatement project unreasonable.

11. Where extreme noise impact is identified (80 dBA Leq or greater), special consideration may be warranted. These sites would be considered on an individual basis.

12. The type of noise abatement feature must provide the benefit dwellings with a reduction of 5 dBA Leq.

Place holder for Figure A.1

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Place holder for Figure A.1

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Place holder for Figure A.1

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Place holder for Figure A.1

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Figure A.2 – Mitigation Measures

Alternative: Existing (2003) - Category B			
Number of Receptors that Exceed or Approach Noise Threshold	**Locations**	**Mitigation Warranted**	**Comments**
1	North of alignment at Indian Prairie Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	South of alignment at Indian Prairie Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Norfolk & Southern RR	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
11	South of alignment at US12	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective
55	North of alignment between Stears Road and Millers Mill Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street and driveway access resulting in the noise shielding being ineffective
48	South of alignment between Stears Road and Millers Mill Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street and driveway access resulting in the noise shielding being ineffective
4	North of alignment between Millers Mill Road and Zerbe Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
15	South of alignment between Millers Mill Road and Zerbe Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street and driveway access resulting in the noise shielding being ineffective
4	North of alignment between Zerbe Road and Garber Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street and driveway access resulting in the noise shielding being ineffective
1	South of alignment between Zerbe Road and Garber Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street and driveway access resulting in the noise shielding being ineffective
6	North of alignment between Garber Road and Gleason Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street and driveway access resulting in the noise shielding being ineffective
5	South of alignment between Garber Road and Gleason Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street and driveway access resulting in the noise shielding being ineffective

Alternative: Existing (2003) - Category C			
Number of Receptors that Exceed or Approach Noise Threshold	**Locations**	**Mitigation Warranted**	**Comments**
0	n/a	n/a	n/a

Figure A.2 – Mitigation Measures

Alternative: No Build (2025) - Category B			
Number of Receptors that Exceed or Approach Noise Threshold	**Locations**	**Mitigation Warranted**	**Comments**
1	North of alignment at Indiana/Michigan Border	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
2	South of alignment at Anderson Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Indiana Prairie Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
2	North of alignment east of Indian Prairie Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	South of alignment at US12	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at US12	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	South of alignment at US12	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at US12	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	South of alignment at Strears Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
100	Located in Historic Commercial District	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
25	Located between Quarterine Road and Millers Mill Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
13	Located between Millers Mill Road and Zerbe Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment east of Zerbe Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
12	Located between Zerbe Road and Barber Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Drummond Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	South of alignment at Drummond Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	South of alignment at Drummond Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Coon Hollow Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable

Alternative: No Build (2025) - Category C			
Number of Receptors that Exceed or Approach Noise Threshold	**Locations**	**Mitigation Warranted**	**Comments**
0	n/a	n/a	n/a

Figure A.2 – Mitigation Measures

Alternative: PA-1 (2025) - Category B

Number of Receptors that Exceed or Approach Noise Threshold	Locations	Mitigation Warranted	Comments
1	South of alignment at Anderson Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at US12	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at US12	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Dickinson Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Millers Mill Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Coon Hollow Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable

Alternative: PA-1 (2025) - Category C

Number of Receptors that Exceed or Approach Noise Threshold	Locations	Mitigation Warranted	Comments
0	n/a	n/a	n/a

Figure A.2 – Mitigation Measures

Alternative: PA-2 (2025) - Category B

Number of Receptors that Exceed or Approach Noise Threshold	Locations	Mitigation	Comments
1	South of alignment at Anderson Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment and east of Indian Prairie Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at US12	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Riverside Drive	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at the St. Joseph River	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Millers Mill Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Gleason Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
2	North of alignment at Coon Hollow Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	South of alignment at Lovers Lane	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable

Alternative: PA-2 (2025) - Category C

Number of Receptors that Exceed or Approach Noise Threshold	Locations	Mitigation	Comments
1	South of alignment at Millard Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable

Figure A.2 – Mitigation Measures

Alternative: PA-3 (2025) - Category B			
Number of Receptors that Exceed or Approach Noise Threshold	**Locations**	**Mitigation Warranted**	**Comments**
1	South of alignment at Anderson Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for driveway access resulting in the noise shielding being ineffective
1	South of alignment at Crampton Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for driveway access resulting in the noise shielding being ineffective
1	South of alignment at Indian Prairie Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for driveway access resulting in the noise shielding being ineffective
1	North of alignment at St. Joseph River	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for driveway access resulting in the noise shielding being ineffective
1	North of alignment at Youngs Prairie Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for driveway access resulting in the noise shielding being ineffective
1	North of alignment at Kings Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for driveway access resulting in the noise shielding being ineffective
1	North of alignment at Coon Hollow Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for driveway access resulting in the noise shielding being ineffective
1	North of alignment at Coon Hollow Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for driveway access resulting in the noise shielding being ineffective
1	North of alignment at Coon Hollow Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for driveway access resulting in the noise shielding being ineffective
1	South of alignment at Wilbur Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for driveway access resulting in the noise shielding being ineffective

Alternative: PA-3 (2025) - Category C			
Number of Receptors that Exceed or Approach Noise Threshold	**Locations**	**Mitigation Warranted**	**Comments**
0	n/a	n/a	n/a

Figure A.2 – Mitigation Measures

Alternative: PA-4 (2025) - Category B			
Number of Receptors that Exceed or Approach Noise Threshold	**Locations**	**Mitigation Warranted**	**Comments**
1	South of alignment at Crampton Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective
1	South of alignment at Indian Prairie Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective
1	South of alignment at Gleason Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective
1	North of alignment at Vetters Chevy Dealer	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective
1	South of alignment at Broadway Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective
1	North of alignment at Coon Hollow Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective
1	North of alignment at Coon Hollow Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective
1	North of alignment at Coon Hollow Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective
1	South of alignment at Wilbur Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective

Alternative: PA-4 (2025) - Category C			
Number of Receptors that Exceed or Approach Noise Threshold	**Locations**	**Mitigation Warranted**	**Comments**
0	n/a	n/a	n/a

Figure A.2 – Mitigation Measures

Alternative: PA-5 (2025) - Category B			
Number of Receptors that Exceed or Approach Noise Threshold	**Locations**	**Mitigation Warranted**	**Comments**
1	South of alignment at Anderson Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Indian Prairie Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
2	North of alignment between Indian Prairie Road to US12	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	South of alignment at US12	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
2	North of alignment at US12	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at US12	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	South of alignment at Dickinson Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Riverside Drive	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	South of alignment at Garber Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	South of alignment at Withers Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Drummond Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	South of alignment at Harder Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable
1	North of alignment at Coon Hollow Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable

Alternative: PA-5 (2025) - Category C			
Number of Receptors that Exceed or Approach Noise Threshold	**Locations**	**Mitigation Warranted**	**Comments**
0	n/a	n/a	n/a

Figure A.2 – Mitigation Measures

Alternative: PA-5-Modified (2025) - Category B			
Number of Receptors that Exceed or Approach Noise Threshold	**Locations**	**Mitigation Warranted**	**Comments**
25	Between Quarterine Road and Millers Mill Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective
13	Between Millers Mill Road and Zerbe Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective
12	Between Zerbe Road and Drummond Road	No	Any noise barrier would only shield one noise receptor; making the mitigation measure unreasonable or noise barrier will require openings in barrier segment for cross street access resulting in the noise shielding being ineffective

Alternative: PA-5-Modified (2025) - Category C			
Number of Receptors that Exceed or Approach Noise Threshold	**Locations**	**Mitigation Warranted**	**Comments**
0	n/a	n/a	n/a